THE

PALESTINE EXPLORATION FUND.

LETTERS ON THE SURVEY.

I.—FROM MR. GEORGE GROVE.

Reprinted from the "Times."

SIR,—It will be seen from your advertising columns that the Palestine Exploration Fund has just despatched its autumn expedition to the Holy Land, and I take the opportunity to explain what we are proposing to do, and to solicit the aid of the public in doing it. It is now proposed to make a complete and minute survey of the whole country west of the Jordan, from the extreme north to the extreme south of the Holy Land proper—"from Dan to Beersheba"—of the same nature with the Ordnance Survey of England and Wales. That is to say, not only will the natural features of the country be accurately mapped, but every town and village, every saint's tomb, every sacred tree or heap of stones, every spot, in short, to which a name is attached—and in Palestine a name is attached to nearly every irregularity of the soil—will be faithfully plotted in our map, and its name written down in Arabic by a competent Arabic scholar, wherever possible by the head man of the village or district, or some other native. Our survey will not only deal with the beaten tracks and frequented places, but will penetrate into those nooks and corners in the entangled hilly country which are never approached by ordinary travellers, but which form three-fourths of the Holy Land, and are as thickly sown with names as the parts along which every stranger passes. In this way alone can a map be obtained which shall answer the wants of modern Biblical topography and of the student anxious to understand the Bible in the thorough manner in which it is worthy to be understood. In some form or other, either of translation, or transference, or corruption, or allusion, there is reason to believe that most of the ancient names are embalmed in the modern ones, and the topography of the Old and New Testaments can never be satisfactorily adjusted, or its correspondence with that of the actual country be made manifest, till the modern names are discovered and recorded in the most ample and detailed manner. This, then, is the

immediate purpose of our present expedition. The archæological investigations recently so ably urged in the *Times* will by no means be neglected. On the contrary, they will receive careful attention. But at present they can only be subsidiary to the Survey, or, at any rate, the two must proceed *pari passu*. The basis of all investigation of a Country and a Book alike so curiously rich in topographical elements, is a thoroughly minute and exhaustive map; and, valuable as the archæology is, the Committee do not think themselves justified in preferring it to the Survey. But they have not left archæology out of their scheme, and they anticipate that, as in the Ordnance Survey of Great Britain and Ireland, a large amount of information on that head will be obtained through the observations of their surveyor.

The Government, always ready to assist the Fund by all means in its power, has been good enough to allow us to have the services of Captain Stewart, R.E., an officer of great experience in the English survey and that of Ceylon, and himself a skilful working photographer. He has already taken his departure with two sappers in whom we hope to see the admirable qualities of Sergeant Birtles and Sergeant Phillips reproduced. At Christmas Captain Stewart will be joined by Mr. Tyrwhitt Drake, already well versed in the language and habits of the East, and favourably known for his journey in the Wilderness of the Wanderings with Professor Edward H. Palmer, of Cambridge. An archæologist will follow as soon as the funds permit.

Captain Stewart will not remain in or near Jerusalem. The works there, necessarily relinquished by Captain Warren on his return to England, are under the charge of Dr. Chaplin, the able surgeon of the English Hospital. For the further prosecution of the investigations at Jerusalem, the Committee have other views, which I hope shortly to explain; but this part of our observations must be kept quite distinct from the survey. In the meantime, should anything special arise, Captain Stewart will be within easy reach of the Holy City, and can be quickly brought to the spot.

My readers will remark that I have spoken only of the west of the Jordan, and that for the very satisfactory reason that the survey of the eastern side has been undertaken by the American committee. At the instance of the Palestine Fund the subject has been taken up by the people of the United States with an earnestness and spirit which fully relieve us from all anxiety as to the successful accomplishment of their portion of the undertaking. This is only natural in the countrymen of Robinson and Lynch, but it is not the less gratifying, and it ought to stir us up to an honourable rivalry in a cause in which England has already done so much, and in which we must remain first in the field.

The time which the survey is estimated to take, from Captain Stewart's arrival to the delivery of the map, with lists, photographs, and drawings, to the Committee, is four years, and the estimated annual cost £3,000. The annual income on which the Committee of the Fund can depend is at present about £2,000, so that an additional annual sum of

£1,000 is required to carry on the survey, in addition to the works at Jerusalem and to the various collateral things which are constantly occurring.

I feel sure that our new undertaking will be well supported in Great Britain by those who have hitherto shown so lively and practical an interest in the exploration of Palestine. The present work is necessarily slow, but it is sure, and it has the advantage over archæological researches that its results are not problematical, but certain. The objects with which it deals are not hidden hundreds of feet below the ground, to be searched for at hazard, but are open on the surface, where their appropriation is only a work of time. Nor are the ultimate results less certain. Those who give their money for the survey may rest assured that the map which will be handed to them at the close of the undertaking will contain the most definite solid aid obtainable for the elucidation of the most prominent of the material features of the Bible. Biblical research has now reached a point at which it cries out for a thoroughly accurate map as indispensable to its further existence. And this thing so much wanted can only be done by the combined efforts of private persons. No Government can undertake it. But the Committee of the Palestine Fund, comprising so many of the leading personages in Church and State, acting under the patronage of Her Majesty the Queen, and employing officers of the Royal Engineers of known skill and character, supplies a guarantee hardly inferior to the guarantee of Government that the work will be thoroughly done. I, therefore, confidently ask the aid which has never yet been refused to my appeals on behalf of this most important branch of investigation, which so peculiarly unites the claims and the interests of Science and Religion.

Your obedient servant,

GEORGE GROVE,

Hon. Sec. Palestine Exploration Fund.

November 7, 1871.

II.—FROM CAPTAIN R. F. BURTON.

The return of Mr. C. F. Tyrwhitt Drake to Damascus on November 5, after his dangerous *reconnaissance* of the 'Ulah or uplands lying between the El Hamah (the Hamath of the Old Testament) and Aleppo, enables me to say a word for the cause lately advocated in your columns by the "Hon. Sec. Palestine Exploration Fund." My friend and fellow-traveller, during a journey of thirty-five days, averaging six miles of riding per diem, sketched and fixed the positions of some fifty ruins which, in presence of the Circassian immigration, now a *fait accompli*, are fated soon to disappear from the face of earth; he is also sending home twenty to twenty-five Greek inscriptions, of which six or seven have dates, and before joining Captain Stewart, R.E., he will

explore the Harrah or Hot country, a pure white blank in the best maps, which, however, have not yet had the opportunity of being good. All except the hydrographic charts have been hurriedly executed; the bearings are mostly in confusion, and the proper names of places are hideously distorted. Let me offer, as a proof, the positions for Palmyra supplied to me by Mr. Stanford, of Charing Cross:

	Deg.	Min.	Sec.		Deg.	Min.	Sec.
1. Duc de Luynes' map; Lieut. Vigne's position	N. lat. 34	32	30	E. lon. 38	14	39	
2. Lieut.-Colonel Chesney's map, published by Walker	N. lat. 34	15	00	E. lon. 38	35	00	
3. Carl Ritter's map	N. lat. 34	17	30	E. lon. 38	32	30	
4. Major Rennell's map.....	N. lat. 34	24	00	E. lon. 38	20	00	

Here then the extremes of difference in latitude amount to seventeen miles, and in longitude to twenty miles, or a total of thirty-seven miles, in fact nearly thirty-eight; and it must be remembered that Palmyra lies within an easy four days' ride of Damascus.

Newly transferred to Syria and Palestine, I imagined—and many would do the same—my occupation as an explorer clean gone. The first few months, however, proved to me that although certain lines of transit have been well trodden, yet few travellers and tourists have ever ridden ten miles away from the high roads. No one, for instance, would suspect that so many patches of unvisited, and possibly at the time unvisitable country, lie within a day or two's ride of great cities and towns, such as Aleppo and Damascus, Hums and Hamah. When the maps have a virgin white in the heart of Jaydur, the classical Ituræa, students naturally conclude that the land has been examined and has been found to contain nothing of interest—the reverse being absolutely the case. Again, there are not a few who will scarcely have stomach for the task when they learn the reasons why these places have escaped European inspection, namely, that they will not afford provisions, forage, or water, or that they are infested by the Bedawin. The latter, indeed, compare favourably with the Klephts; they have not got to detain you for ransom or to threaten you with excision of the nose and ears unless your friends consent at once to pay the exorbitant demand; they will spear you a little, as they did a French Secretary of Legation at Athens who expected to put a Razzia to flight like monkeys by firing a revolver, but they will not kill you in cold blood except according to the strict *lex talionis*. Still, even under these mitigated circumstances, travellers, certain that an escort unless of overpowering numbers will at once turn tail, hardly care to expose themselves, their attendants, and their effects to a charge of Bedawin cavalry.

Again, the places have escaped exploration simply because the dragoman disliked them. Not a few readers, even professed geographers, would suppose that in describing the Anti-Libanus, as I propose to do, my task would be limited to filling up with minor details the correct

outlines traced by predecessors. The contrary is positively the case. Surprising as it may appear, it is still true that the best and truest modern maps—I bring no charge against the mappers—do not name a single valley north-east of Zebedâni, nor a single summit except the "Jebel el Halímah"—an utter misnomer. They show merely the long conventional caterpillar, flanked by the usual acidulated drops, and seamed with the normal thread of drainage; when they have disposed all this parallel with the Libanus, they have apparently done their duty. The traveller, with his handbook, perfectly ignores the fact that the general aspect of the range is far superior to that of the Western Sierra; that the colouring of the rock is richer; that the forms are more weird, savage, and picturesque; that the contrasts of shape and hue are sharper, and that the growth assumes in places the semblance of a thinned forest. As will presently appear, the range is in many points more remarkable than its maritime sister, and it may in fact be called a section of new ground in an old land.

Your correspondent (Nov. 7) has effectively pointed out the nature of the work required by the Bible lands proper, "from Dan to Beersheba," where there is nothing barren of interest. It is to be hoped, however, that the funds will soon permit an archæologist to follow the surveyor. Although the East moves slowly, still she moves, but her present movement is all towards the change of ancient and Oriental to modern and European art, and in many places to the destruction of the most valuable remains of antiquity. The ruins of the 'Ulah are being pulled to pieces in order to build houses for Hamah. The classical buildings of Saccæa are torn down and set up into rude hovels for the mountaineers who have fled from the Anti-Libanus and the Hermon. Patterns which possibly antedate the Pyramids are making way for cheap English calico prints. The porcelain sent from China is sold or stowed away, and the table is decked with bits of French stuff, all white and gold, and worth, perhaps, a franc a piece.

Allow me to conclude with again attempting to impress upon subscribers to the Palestine Exploration Fund that Syria, north of Palestine proper, is an old country, in more than one aspect, geographical and technological for instance, virtually new. A Land of the Past, it has a Future as promising as that of Mexico or of the Argentine Republic. The first railway that spans it will restore to rich and vigorous life the poor old lethargic region; it will raise this Lazarus of eastern provinces from his neglected grave. There is literally no limit that can be laid down to the mother-wit, to the ambition, and to the intellectual capabilities of its sons—they are the most gifted race that I have, as yet, ever seen. And when the curse shall have left the country, the plague-spot of bad rule, it will again rise to a position not unworthy of the days when it gave to the world a poetry and a system of religion still unforgotten by our highest civilisation.

RICHARD F. BURTON, F.R.G.S.

Howlett's Hotel, December 14, 1871.

III.—From the Rev. F. W. Holland.

Reprinted from the "Guardian."

Sir,—Three years ago you kindly inserted in your columns a letter from me asking for the help of the clergy and your other readers in carrying out the Ordnance Survey of the Peninsula of Sinai.

Owing in great measure to your assistance the necessary funds were collected, and the survey was brought to a successful issue.

May I again be allowed a little space to advocate the claims of a similar work, the survey of the Holy Land? The Committee of the Palestine Exploration Fund has already despatched an expedition for this purpose, consisting of Captain R. W. Stewart, R.E., and two non-commissioned officers selected from the staff of the Ordnance Survey. Mr. C. F. Tyrwhitt Drake, who is an experienced Eastern traveller, and a good Arabic scholar, is to join them, as soon as he has completed some explorations which he is now making in the country north-east of Damascus.

By this time Captain Stewart must have commenced his survey. Full details of his instructions are given in the last *Quarterly Statement* of the Palestine Fund. I will not, therefore, occupy your space by repeating them. Suffice it to say that the Government has approved of the survey, and has given every assistance in its power; and that no expense or trouble has been spared to render the organisation of the expedition as complete as possible.

Our main objects are to obtain an accurate map of the country west of the Jordan, on which, in addition to the topographical features, shall be laid down the positions of all towns, villages, ruins, roads, &c.; (the American Palestine Exploration Society, working side by side with us, will undertake the survey of the country lying on the east of the Jordan); to explore the mountains and hill-tops which formed generally the homes of the ancient inhabitants; to collect all existing traditions and names; and to search for and examine all remains of archæological interest.

Let it not be thought, however, that we have given up the intention of carrying on Captain Warren's work at Jerusalem. The Holy City must always remain the central point of interest; and no occasion will be lost of proceeding with the excavations there whenever any opportunity may occur which seems to promise decisive results. We shall always have an agent at Jerusalem, who will be in constant communication with Captain Stewart.

But for these explorations additional funds are required. The present income of the Society is not adequate for the work. We must have at least £1,000 a year more to carry on the work on its present scale; and it could be far more effectually and more cheaply done by the employment of a larger staff.

We appeal, then, for help to enable us to carry out this important undertaking to a successful completion. Surely we shall not appeal in

vain; for our object is not to establish this or that theory, but by throwing more light upon the Land of the Bible, to illustrate and explain the pages of the Bible itself.

F. W. HOLLAND, *Hon. Sec.*

November 27, 1871.

LETTERS FROM MR. C. F. TYRWHITT DRAKE.

I.

DAMASCUS, *June* 11, 1871.

I enclose a few of the inscriptions that I copied (in all about 120) in Jebel Druze Hauran. I have had no time to write out more of them. I was only there a few days, so did not collect so many as I hope to do on a second visit. Some of them have, I know, been already copied, but others were so covered with lichen that it was impossible to make anything out till I had cleaned them; others were concealed by plaster in the houses. From Jebel ed Druze, after much opposition from the Druzes at Shukka, who were afraid to accompany us and were ashamed of letting us go alone, we went to Umm Nirán (*Mother of Fires*), a curious cavern, partly natural and partly artificial, in the great volcanic outburst called El Wár. There are no ruins near it, and it is very curious, as water drips from the roof and the whole of the country above is an arid fiery waste of black lava. Thence we went to El Akir and other volcanic tells in the neighbourhood, thence to Bir Kasam, and afterwards to Jebel Dakweh. From these volcanoes, many of which are of considerable size, I was able to lay down the whole series of tells north of the Safa. From Jebel Dakweh we went to Dumeir, and just missed, by a few hours, a foray of one hundred horsemen and two hundred men on camels, who seem to have been dodging us for two days, but who missed us owing to our erratic course. They plundered Harran El Awamíd, and two neighbouring villages within half an hour's ride of a camp of six hundred Turkish soldiers.

In the Hauran we found the true source of the Leja (Tell Shihan), which seems to have been quite overlooked by previous travellers. Wetzstein's "great lava stream," from Jebel Kuleib (which we ascended) only exists on his map. Jebel Kuleib, *the turning-point*, not as Mr. Porter translates it, the *little heart*.

II.

DAMASCUS, *June* 29, 1871.

Since I last wrote I have been to Hums and Hamah, and will now lay before you the results of my journey.

Hums (the ancient Emesa) is a town of great importance; the country

around it is very fertile, producing large quantities of grain. The manufactures, which chiefly consist of silk goods, are largely exported to Egypt and Abyssinia, and are justly valued. The silk is produced in the Nuseíri mountains, and is of good quality. The houses are built of mud or stone (the latter is chiefly basalt); and I found a large number of Greek inscriptions built into the walls, but as they were *invariably* broken (the better to serve for building purposes), I only copied a few as examples.

There is a large Christian population, consisting of 5,500 Greek orthodox and 1,500 Jacobites and other denominations. Of the churches belonging to the former, that of the forty martyrs is the most important; the apse is circular, and has a gigantic figure of the Virgin painted in it; the body of the church is modern, but constructed with columns, &c., taken from an older building. Tradition relates that the church was built by Justinian, but there is nothing to prove this in any part of the edifice as it now stands. The wood carving of the screen in front of the altar is handsome—the work of a Damascus artist about thirty years ago. The church in the Deir Mar Elyan (convent of St. Elias) was rebuilt about twenty-five years ago. Behind the altar, at the south-east corner, is the tomb of Mar Elyan, a handsome marble sarcophagus, whose length is 7ft. 6in., breadth, 3ft. 2½in., and height, 2ft. 5in., the cover being 2ft. 1in. more. At each corner of the lid, which is ridged, is a square pillar, surmounted by a round ball. There are two crosses at each side and one at each end, as well as one on each side of the lid, which was formerly clamped on in four places. The sarcophagus is in perfect preservation, and is said to have been originally brought from Russia. There are now no monks in the Deir, which is believed by the native Christians to be the earliest ever founded in the country.

The Syriac church was built only nine years ago, and contains nothing of interest.

The great mosque is called the Jami'a en Núrí, and was formerly a Christian church, dedicated to Mary, Mother of Light, whence the modern name En Núrí (Light). In the court of the mosque I observed a number of grey and red granite columns and a few mutilated capitals. To the south side of the mosque itself is a small dark chamber, where the head of John the Baptist is said to be buried. In restoring the mosque a few years ago, some bones were discovered under the pavement. As they exhaled a sweet odour, they were unanimously voted the bones of some saint, and were re-interred in the centre of the pillar to the north-west of the Mihrab. In this prayer-niche some mosaic has been used, relics of the former building.

The Madnet Meshed, or, as it is frequently called, Madnet Sheikh Hammed (Minaret of Sheikh Hammed), is considered by the natives of great antiquity. It is merely a square tower of black basalt, divided externally by cornices into four stories, and ascended internally by a staircase built round, and square centre, and terminating at top in a chamber floored with basalt slabs. The roof has disappeared, as have

many portions of the staircase, which renders the ascent somewhat difficult. I enclose the copy of an inscription on the outside.

There are many ornamented sarcophagi in the town used as water troughs, &c., and are called by the people Rasd (pl. arsad), and are named from some fancied likeness in the patterns to beasts and birds, as the Rasd el'Akrab (scorpions), near the Bab es Suk, el Afá'i (snakes), and el Haiyát (snakes), &c. I found, however, nothing but wreaths and conventional patterns sculptured upon them.

I was continually being taken off to see inscriptions in Hebrew or some unknown character, but they always turned out to be Cufic—generally very badly written—or, as in one case, a very conventional pattern of grapes and vine leaves. Many of the existing fragmentary inscriptions have been brought from neighbouring ruins. This fact, combined with their mutilated state, renders them of little, if any, value.

The Kala (fortress) is most conspicuous and interesting. It consists of an oval mound about 100ft. high, and surrounded by a moat some 25ft. in depth, which is still perfect towards the west and south-west. The outer casing of the mound is Saracenic, and consists of a mass of masonry from five to eight feet thick, bound together with mortar, and faced with small squares of basalt. Pillars of basalt and limestone, taken from a former building, are used as ties. In some places, as at the south-east, where this outer casing has been destroyed, two other, and of course more ancient, escarpments appear: these are built of limestone (conglomerate). A considerable portion of the upper part of the mound appears to be formed of made earth, as I noticed beneath the innermost casing layers of ashes and burnt soil, as well as a few fragments of pottery. To the north-east some portions of a well-built wall of white limestone are visible, and these Captain Burton considers to be remains of the well-known Temple of the Sun. There being no other elevated ground in the neighbourhood of Hums, this supposition is rendered extremely probable, which is confirmed by local tradition. To the west of the Kala are ruins of a handsome Roman brick tower, in good style, ornamented exteriorly with pilasters, cornices, and diaper work, executed in basalt and limestone.

The only ancient tomb I found was to the south-east of the Kala. The excavated chamber was filled up with rubbish, but was described to me by a man who had seen it as containing six loculi formed of slabs of stone, arranged three on each side. A flight of steps descend to a stone door, from which a passage, covered with slabs of basalt, led to the chamber. With the exception of the door, the other stones have been displaced, and are being carried away for building purposes. I found a few fragments of glass near his tomb.

From Hums to Hamah the distance is about twenty-one miles ; the road passes Restán (*Arethusa*), where the ruins are interesting as showing the dispositions of the streets very clearly. Excavations here would probably be productive. I did not find any inscriptions, and all

antiques or coins are taken to Hums and Hamah, where they are bought up by the Christian silversmiths, who as a class are such consummate liars and cheats, and consider all engraved stones and coins of such unknown value, that it is almost impossible to deal with them.

Hamah, a much larger town than Hums, is situated in a depression not unlike a vine leaf in shape, on the banks of the 'Assy (Orontes). A mound similar to that at Hums, but larger, marks the site of the ancient Kala, and stands on the south bank of the river. All the stones have been taken away for building purposes, but to the east, masses of rubble and sun-dried bricks are still visible.

One of the most striking features of Hamah are the Ná'úrahs, water-wheels from twenty to seventy-five feet in diameter, intricate edifices of timber which, by means of boxes round the edge, throw the water into aqueducts which irrigate the gardens. Each Ná'úrah belongs to a company, who keep it in repair. The creaking of these huge machines, which spill as much water as they lift, is ceaseless, and monotonously discordant. In all there are about twenty of them; the principal one is the Mohammedíyeh, to the west of the Kala. El Khudúrah is also large. To the south-east of the Kala are El Jisriyeh on the north-east, and El Mamúríyeh on the south-west bank. The current of the Orontes is strong and very deep. Fish are plentiful.

El Jami'a el Kibír (the great mosque) was originally a Christian church. There is a Greek inscription over one of the windows (seemingly a sister one to that which now forms the altar of St. Michael in the Greek church of the Blessed Virgin) and another long inscription is said to be covered with plaster in the interior of the building. The mosque has two rows of four pillars each; the nave has three domes, and there is another over the Mihrab; the aisles and ends of the nave are vaulted. On the outside a flat projecting cornice is supported by heavy corbels. In the courtyard there is a small dome (similar to that which contains the books in the great mosque at Damascus) supported on eight pillars, with acanthus capitals.

Many of the mosque towers are in good taste; the reddish yellow limestone and black basalt are well contrasted in artistic patterns.

The Greek orthodox Christians here number about 200 men (*i.e.* houses), and there are a few Jacobites. The churches contain little of interest. The colony of Jews was driven out some fifty or sixty years ago, on account of the disappearance of a Turkish girl in their quarter, and have never been allowed to return. I visited their cemetery, and have copied the solitary inscription there which seems to have been over the entrance to an excavated place of burial. This cemetery, Kabúr el Yehúd, lies about one mile north-west of the town on the plateau. The cliffs between it and the town are full of caves, now used as dwellings and storehouses. All that I saw seemed originally made for those purposes, and not for sepulchres.

To the south of the town a deep fosse is cut on the edge of the

plateau, only leaving room for two or three rows of houses. There are traces here of the old wall.

My primary object, of course, in visiting Hamah was to examine the hieroglyphic inscriptions, and hearing that fabulous prices had been asked by the owners, I was exceedingly cautious, and spoke to no one about them, but waited till they were shown to me, which occurred on the second day of my stay there. I then endeavoured to eradicate the idea of great value, and I hope succeeded to a great extent. The next day I took squeezes and photographs. The former are good, but the latter, owing to an accident to my baggage animal, are not successful. I hope, however, to return to Hamah before the autumn, when I shall take plaster casts and other photographs.

III.

Salahiyeh, Damascus, *Sept.* 30, 1870.

I start to-morrow upon a journey into North Syria, which will probably occupy me a month or five weeks' hard riding. I intend, if not effectually stopped by the Bedawin, to push as far as Rusáfa, on the Euphrates; here there is an enormous castle about which the Bedawin tell me marvellous stories, and, as far as I can make out, no European has ever approached it. On returning I shall visit the 'Ulah, to the east and north-east of Hamah, where 365 ruined towns are said to exist; they are full of Greek inscriptions, and resemble in architecture the so called Giant Cities of Bashan, *i.e.*, they are of the Beni Ghassan type.

C. F. Tyrwhitt Drake.

Note.—By the latest intelligence received, Mr. Drake has returned to Damascus, after passing through the Ulah to Aleppo. The Ulah (uplands) begins on a parallel east of Hamah, the ancient Hamath. It is marked in some of our maps as the Great Syrian Desert, an unfortunate misnomer, as it is a region exceptionally *riant* and fertile. Unfortunately, the Bedawin have been allowed to harry the country, and consequently the 360 towns which once existed there are now all in ruins. The extensive immigration of Circassians which has recently taken place will also tend further to the destruction of these remains. It is, therefore, gratifying to add that Mr. Drake has returned laden, not only with sketches, plans, measurements, but also with Greek inscriptions, of which there are a great number lying about. These would, of course, if left uncopied, soon have perished with the stones on which they are inscribed.

THE TRACT "MIDDOTH"—ON THE MEASUREMENTS OF THE TEMPLE.*

LITERALLY TRANSLATED FROM THE MISHNA.

I. The priests guarded the sanctuary in three places—in the House Abtinas,† in the House Nitzus,‡ and in the House Moked;§ and the Levites in twenty-one places, five at the five gates of the Mountain of the House, four at its four corners inside, five at the five gates of the court, four at its four corners outside, and one in the chamber of the offering, and one in the chamber of the vail, and one behind the house of Atonement.

II. The captain of the Mountain of the House went round to every watch in succession with torches flaming before him; and to every guard who did not stand forth the captain said, "Peace be to thee." If it appeared that he slept, he beat him with his staff, and he had permission to set fire to his cushion. And they said, "What is the voice in the court?" "It is the voice of the Levite being beaten, and his garments burned, because he slept on his guard." Rabbi Eliezer, the son of Jacob, said, "Once they found the brother of my mother asleep, and they burned his cushion."

III. There were five gates to the Mountain of the House—two Huldah gates in the south which served for going in and out; Kipunus in the west served for going in and out; Tadi‖ in the north served for no ordinary purpose. Upon the east gate was portrayed the city Shushan. Through it, one could see the high priest who burned the heifer, and all his assistants going out to the Mount of Olives.

IV. In the court were seven gates—three in the north, and three in the south, and one in the east. That in the south was called the gate of flaming; the second after it the gate of offering; the third after it the water-gate; that in the east was called the gate Nicanor. And this gate had two chambers, one on the right and one on the left. One the chamber of Phineas the vestment keeper, and the other the chamber of the pancake maker.

V. And at the gate Nitzus on the north was a kind of cloister with a room built over it where the priests kept ward above and the Levites below; and it had a door into the Chel.¶ Second to it was the gate of the Offering; third, the House Moked.

VI. In the House Moked were four chambers opening as small apartments into a saloon—two in the holy place and two in the unconsecrated place; and pointed rails separated between the holy and the unconsecrated. And what was their use? The south-west chamber was the chamber for the offering; the south-east was the chamber for the shew bread; in the north-east chamber the children of the

* Reprinted in Jerusalem, 1867, and presented to the Fund by Capt. Warren.
† A famous maker of incense. ‡ Sparkling. Burning. ‖ Obscurity
¶ Platform, or rampart.

Asmoneans deposited the stones of the altar which the Greek kings had defiled. In the north-west chamber they descended to the house of baptism.

VII. To the House Moked were two doors—one open to the Chel, and one open to the court. Said Rabbi Judah, "The one open to the court had a wicket through which they went in to sweep the court."

VIII. The House Moked was arched, and spacious, and surrounded with stone divans, and the elders of the Courses slept there with the keys of the court in their hands; and the young priests each with his pillow on the ground.

IX. And there was a place a cubit square with a tablet of marble, and to it was fastened a ring, and a chain upon which the keys were suspended. When the time approached for locking, the priest lifted up the tablet by the ring, and took the keys from the chain and locked inside, and the Levite slept outside. When he had finished locking, he returned the keys to the chain, and the tablet to its place—laid his pillow over it and fell asleep. If sudden defilement happened, he rose and went out in the gallery that ran under the arch, and candles flamed on either side until he came to the house of baptism. Rabbi Eleazer the son of Jacob says: "In the gallery that went under the Chel he passed out through Tadi."

Our Beauty be upon Thee in Three Places.

I. The Mountain of the House was five hundred cubits square. The largest space was on the south, the second on the east, the third on the north, and the least westward. In the place largest in measurement was held most service.

II. All who entered the Mountain of the House entered on the right-hand side, and went round, and passed out on the left; except to whomsoever an accident occurred he turned to the left. "Why do you go to the left?" "I am in mourning." "He that dwelleth in this house comfort thee." "I am excommunicate." "He that dwelleth in this house put in thy heart repentance, and they shall receive thee." The words of Rabbi Mayer, to him said Rabbi Jose, "Thou hast acted as though they had transgressed against him in judgment; but, may He that dwelleth in this house put in thy heart that thou hearken to the words of thy neighbours, and they shall receive thee."

III. Inside of the Mountain of the House was a reticulated wall ten handbreadths high; and in it were thirteen breaches broken down by the Greek kings. The Jews restored, and fenced them, and decreed before them thirteen acts of obeisance. Inside of it was the Chel ten cubits broad, and twelve steps were there. The height of each step was half a cubit, and the breadth half a cubit. All the steps there were in height half a cubit, and in breadth half a cubit, except those of the porch. All the doors there were in height twenty cubits, and in breadth ten cubits, except that of the porch. All the gateways there had doors, except that of the porch. All the gates there had lintels,

except Tadi; there two stones inclined one upon the other. All the gates there were transformed into gold, except the gate Nicanor, because to it happened a wonder, though some said "because its brass glittered like gold."

IV. And all the walls there were high, except the eastern wall, that the priest who burned the heifer might stand on the top of the Mount of Olives and look straight into the door of the sanctuary when he sprinkled the blood.

V. The court of the women was one hundred and thirty-five cubits in length, by one hundred and thirty-five in breadth. And in its four corners were four chambers, each forty cubits square, and they had no roofs; and so they will be in future, as is said, "Then he brought me forth into the utter court, and caused me to pass by the four corners of the court; and, behold, in every corner of the court there was a court."* In the four corners of the court there were courts smoking, yet not smoking, since they were roofless. And what was their use? —the south-east one was the chamber of the Nazarites, for there the Nazarites cooked their peace-offerings, and polled their hair, and cast it under the pot. The north-east was the chamber for the wood, and there the priests with blemishes gathered out the worm-eaten wood. And every stick in which a worm was found, was unlawful for the altar. The north-west was the chamber for the lepers. The south-west? Rabbi Eleazar, the son of Jacob, said: "I forget for what it served." Abashaul said, "There they put wine, and oil." It was called the chamber of the house of oil. And it was open at first and surrounded with lattice work, that the women might see from above, and the men from beneath, lest they should be mixed. And fifteen steps, corresponding to the fifteen steps in the Psalms, ascended from it to the court of Israel, upon them the Levites chanted. They were not angular, but deflected like the half of a round threshing-floor.

VI. And under the court of Israel were chambers open to the court of the women. There the Levites deposited their harps, and psalteries, and cymbals, and all instruments of music. The court of Israel was one hundred and thirty-five cubits long, and eleven broad; and likewise the court of the Priests was one hundred and thirty-five cubits long, and eleven broad. And pointed rails separated the court of Israel from the court of the Priests. Rabbi Eleazar, the son of Jacob, said: "There was a step a cubit high, and a daïs placed over it; and in it were three steps each half a cubit in height." We find that the Priests' court was two and a half cubits higher than the court of Israel. The whole court was one hundred and eighty-seven cubits in length, and one hundred and thirty-five cubits in breadth, and the thirteen places for bowing were there. Abajose, the son of Chanan, said: "In front of the thirteen gates." In the south near to the west were the upper gate—the gate of flaming, the gate of the first-born—the water-gate. And why is it called the water-gate?—because through it they

* Ezekiel xlvi. 21.

bring bottles of water for pouring out during the feast of tabernacles. Rabbi Eleazar, the son of Jacob, said: "Through it the water returned out, and in future it will issue from under the threshold of the house." And opposite them in the north near to the west the gate of Jochania—the gate of the offering, the gate of the women, the gate of music. And "why was it called the gate of Jochania"?—"because through it Jochania went out in his captivity." In the east was the gate Nicanor and in it two wickets, one on the right, and one on the left, and two in the west, which were nameless.

Our Beauty be upon Thee, O Mountain of the House.

I. The altar was thirty-two cubits square. It ascended a cubit and receded a cubit. This was the foundation. It remains thirty cubits square. It ascended five cubits, and receded one cubit. This is the circumference. It remains twenty-eight cubits square. The place for the horns was a cubit on either side. It remains twenty-six cubits square. The place of the path for the feet of the priests was a cubit on each side. The hearth remains twenty-four cubits square. Rabbi Jose said: "At first it was only twenty-eight cubits square." It receded, and ascended until the hearth remained twenty cubits square; but when the children of the captivity came up, they added to it four cubits on the north, and four cubits on the west like a gamma, it is said; and the altar was twelve cubits long by twelve broad, being a square. One could say it was only "a square of twelve"* as is said. Upon its four sides we learn that it measured from the middle twelve cubits to every side. And a line of red paint girdled it in the midst to separate the blood above from the blood below. And the foundation was a perfect walk along the north side, and all along on the west, but it wanted in the south one cubit, and in the east one cubit.

II. And in the south-western corner were two holes as two thin nostrils, that the blood poured upon the western and southern foundation should run into them; and it commingled in a canal, and flowed out into the Kidron.

III. Below in the plaster in the same corner there was a place a cubit square, with a marble tablet, and a ring fastened in it. Through it they descended to the sewer, and cleansed it. And there was a sloping ascent to the south of the altar thirty-two cubits long by sixteen broad. In its western side was a closet where they put the birds unmeet for the sin offering.

IV. Either the stones of the sloping ascent, or the stones of the altar, were from the Valley of Bethcerem.† And they digged deeper than virgin soil, and brought from thence perfect stones over which iron was not waved. For the iron defiles by touching. And a scratch defiles everything. In any of them a scratch defiled, but the others were lawful. And they whitewashed them twice in the year, once at

* Ezekiel xliii. 16. † House of the Vineyard.

the Passover, and once at the feast of tabernacles. And the sanctuary was whitewashed once at the Passover. The rabbi said "every Friday evening they whitewashed them with a mop on account of the blood." They did not plaster it with an iron trowel "mayhap it will touch and defile." Since iron is made to shorten the days of man, and the altar is made to lengthen the days of man. It is not lawful that what shortens should be waved over what lengthens.

V. And there were rings to the northern side of the altar, six rows of four each, though some say four rows of six each. Upon them they slaughtered the holy beasts. The slaughter house was at the north side of the altar, and in it were eight dwarf pillars with a beam of cedar wood over them. And in them were fastened iron hooks—three rows to each pillar; upon them they hung up the bodies; and skinned them upon marble tables between the pillars.

VI. The laver was between the porch and the altar, but inclined more to the south. Between the porch and the altar were twenty-two cubits, and there were twelve steps; the height of each step was half a cubit, and its breadth a cubit—a cubit—a cubit—a landing three cubits—a cubit—a cubit, and a landing three cubits; and the upper one a cubit—a cubit, and the landing four cubits. Rabbi Jehudah said "the upper a cubit—a cubit, and the landing five cubits."

VII. The doorway of the porch was forty cubits high, and twenty broad; over it were five carved oak beams. The lower one extended beyond the doorway a cubit on either side; the one over it extended a cubit on either side. It results that the uppermost was thirty cubits, and between each one there was a row of stones.

VIII. And stone buttresses were joined from the wall of the sanctuary to the wall of the porch, lest it should bulge; and in the roof of the porch were fastened golden chains upon which the young priests climbed up, and saw the crowns; as is said, "and the crowns shall be to Helem, and to Tobijah, and to Jedaiah, and to Hen the son of Zephaniah, for a memorial in the temple of the Lord."* And over the doorway of the sanctuary was a golden vine supported upon the buttresses. Every one who vowed a leaf, or a berry, or a cluster he brought it and hung it upon it. Said Rabbi Eleazar, the son of Zadok, "it is a fact, and there were numbered three hundred priests to keep it clear."

Our Beauty be upon Thee, O Altar.

I. The doorway of the sanctuary was twenty cubits in height, and ten in breadth, and it had four doors—two within and two without, as is said—"two doors to the temple and the holy place."† The outside doors opened into the doorway to cover the thickness of the wall, and the inside doors opened into the sanctuary to cover the space behind the doors, because the whole house was overlaid with gold, excepting behind the doors. Rabbi Judah said, "they stood in the middle of the

* Zechariah vi. 14. † Ezekiel xli. 23.

doorway and like a pivot these folded behind them two cubits and a half; and those two cubits and a half. Half a cubit and a jamb on this side, and half a cubit and a jamb on the other side." It is said "two doors to two doors folding back—two leaves to one door and two leaves to the other."*

II. And the great gate had two wickets—one in the north, and one in the south. Through the one in the south no man ever entered; and with regard to it Ezekiel declared—as is said—"The Lord said unto me, This gate shall be shut, it shall not be opened, and no man shall enter in by it, because the Lord, the God of Israel, hath entered in by it, therefore it shall be shut."† The priest took the key and opened the wicket, and went in to the little chamber, and from the chamber to the sanctuary. Rabbi Judah—"he went in the thickness of the wall until he found himself standing between the two gates, and he opened the outside gates from inside, and the inside from outside."

III. And there were thirty-eight little chambers, fifteen in the north, fifteen in the south, and eight in the west. The northern and southern ones were placed five over five, and five over them; and in the west three over three and two over them. To each were three doors. One to the little chamber to the right, one to the little chamber to the left, and one to the little chamber over it. And in the north-eastern corner were five gates, one to the little chamber on the right and one to the little chamber over it, and one to the gallery, and one to the wicket, and one to the sanctuary.

IV. The lowest row was five cubits, and the roofing six cubits, and the middle row six and the roofing seven, and the upper was seven—as is said, "the nethermost chamber was five cubits broad, and the middle six cubits broad, and the third seven cubits broad."‡

V. And a gallery ascended from the north-eastern corner to the south-western corner. Through it they went up to the roofs of the little chambers. One went up in the gallery with his face to the west. So he proceeded all along the northern side till he reached the west. On reaching the west he turned his face southward going along the west side till he reached the south. On reaching the south with his face to the east he went along the south side till he arrived at the door of the upper story, because the door of the upper story opened in the south side; and at the door of the upper story were two cedar-beams. By them they went up to the roof of the upper story, and on its summit rails separated between the holy and the holy of holies; and in the attic trapdoors opened to the holy of holies. Through them they let down the workmen in boxes, lest they should feast their eyes in the holy of holies.

VI. The sanctuary was a square of one hundred cubits, and its height one hundred. The foundation six cubits, and the height of the wall forty cubits, and the string course§ one cubit, and the rain

* Ezekiel xli. 24. † xliv. 2. ‡ 1 Kings vi. 6.

§ Curiously graven and gilt.

channel two cubits, and the beams one cubit, and the covering plaster one cubit; and the height of the upper story was forty cubits, and the string course one cubit, and the rain channel two cubits, and the beams one cubit, and the covering plaster one cubit, and the battlement three cubits, and the scarecrow one cubit. Rabbi Judah said "the scarecrow was not counted in the measurement, but the battlement was four cubits."

VII. From east to west were one hundred cubits. The wall of the porch five, and the porch eleven, and the wall of the sanctuary six, and the interior forty, and the partition space between the vails one, and the holy of holies twenty cubits; the wall of the sanctuary was six, and the little chamber six, and the wall of the little chamber five. From north to south were seventy cubits. The wall of the gallery five, the gallery three, the wall of the little chamber five, the little chamber six, the wall of the sanctuary six, its interior twenty; the wall of the sanctuary six, the little chamber six; the wall of the little chamber five, the place for the descent of the water three, and the wall five cubits. The porch was extended beyond it fifteen cubits in the north, and fifteen in the south; and this space was called "the house of the instruments of slaughter," because the knives were there deposited. And the sanctuary was narrow behind and broad in front and it was like a lion, as is said, "Ho! Ariel the city where David dwelt,* as a lion is narrow behind and broad in front, so the sanctuary is narrow behind and broad in front."

Our Beauty be upon Thee, Door of the Sanctuary.

I. The length of the whole court was one hundred and eighty-seven cubits; the breadth one hundred and thirty-five. From east to west one hundred and eighty-seven. The place for the tread of the feet of Israel was eleven cubits; the place for the tread of the priests eleven cubits; the altar thirty-two; between the porch and the altar twenty-two cubits; the temple one hundred cubits; and eleven cubits behind the House of Atonement.

II. From north to south one hundred and thirty-five cubits; from the sloping ascent to the altar sixty-two; from the altar to the rings eight cubits; the space for the rings twenty-four; from the rings to the tables four; from the tables to the pillars four; from the pillars to the wall of the court eight cubits. And the remainder lay between the sloping ascent and the wall and the place of the pillars.

III. In the court were six chambers—three in the north and three in the south. In the north the chamber of salt—the chamber of Parva—the chamber of washers. In the chamber of salt they added salt to the offering; in the chamber of Parva they salted the skins of the offering; and upon its roof was the house of baptism for the high priest on the day of atonement. In the chamber of washers they cleansed the inwards of the offerings; and from thence a gallery extended up to the top of the house of Parva.

* Isaiah xxix. 1.

IV. In the south were the chamber of wood—the chamber of the captivity—and the chamber of hewn stone. The chamber of wood—said Rabbi Eleazar the son of Jacob, "I forget for what it served." Abashaul said, "the chamber of the high priest was behind them both, and the roof of the three was even. In the chamber of the captivity was sunk the well with the wheel attached to it, and from thence water was supplied to the whole court. In the chamber of hewn stone the great sanhedrim of Israel sat, and judged the priesthood, and the priest in whom defilement was discovered clothed in black and vailed in black went out and departed; and when no defilement was found in him clothed in white and vailed in white he went in and served with his brethren the priests. And they made a feast-day because no defilement was found in the seed of Aaron the priest, and thus they said "Blessed be the place; blessed be he since no defilement is found in the seed of Aaron; and blessed be He who has chosen Aaron and his sons to stand and minister before the Lord in the house of the Holy of Holies."

Our Beauty be upon Thee, whole Court; and Completion to Thee, Tract Measurements.

Note.—The Committee are not responsible for the accuracy of the above translation, which is printed *verbatim* from the pamphlet presented by Captain Warren.

REMARKS ON THE CLIMATE OF JERUSALEM.*

From Observations made by Dr. Thomas Chaplin, for Three Years and Four Months, beginning 1st November, 1863, and ending 28th February, 1867.

Lat. 31° 46′ 45″ N.; Long. 35° 13′ 0″ E.; Height above the Sea, 2,500 feet. Hour of Observation, 9 a.m.

By Alexander Buchan, Secretary to the Scottish Meteorological Society.

While on a tour through Palestine in the spring of 1863, Dr. Keith Johnston, the Society's honorary secretary, made arrangements with Dr. Thomas Chaplin for making meteorological observations at Jerusalem. The Board of Trade most cordially co-operated with the Society in the supply of instruments, and forwarded to Dr. Chaplin first two standard barometers, and then other two to replace the former ones, which had been broken, or otherwise rendered useless. All the instruments sent were verified. The thermometers have been kept in a louvre-boarded box of the pattern designed by Mr. Thomas Stevenson, C.E., and in extensive use among the Society's observers. Thus

* Reprinted by permission from the *Journal of the Scottish Meteorological Society*. A second *resumé* of Dr. Chaplin's observations for this society is in process of preparation, and has been also kindly promised for this journal.

every care was taken to procure observations of the most trustworthy description. The observations commenced in November, 1863, and have been uninterruptedly carried on since. They are made daily at 9 a.m. Abstracts of two years' observations accompany this paper, in Table I., in continuation of previous abstracts. And in Table II. are given, for each month and for the year, the means and extremes calculated on an average of the three and one-third years during which the observations have been carried on,—a space of time sufficient to furnish materials for a first and close approximation to the climate of that interesting country.

Atmospheric Pressure.

The mean annual pressure of the atmosphere, reduced to 32°·0, is 27·391 inches. There is one maximum and one minimum period in the year; the maximum occurring in January, when the mean pressure is 27·451; and the minimum in July, when it is 27·278. Thus the difference between the months of greatest and least mean pressure is 0·113 inches. At the level of the sea the difference between the months of extreme pressure would be much greater, because in summer the atmosphere is increased in volume by the higher temperature, and consequently a considerable part of it is thrust up above such elevated stations as Jerusalem (2,400 feet), thus increasing the summer pressure. Reducing the monthly averages to sea level, the annual mean pressure is 30·052 inches,—the maximum 30·211 in January, and the minimum 29·870 in July; thus giving a difference of 0·341 between the highest and lowest monthly pressures.

The highest mean pressure, reduced to 32°·0 only, of any of the forty months, was 27·507 in February 1867, and the lowest 27·267 in July 1867; or, reduced to sea-level, 30·296 and 29·860 respectively, thus giving, in the latter case, a difference of 0·436.

The highest single reading that has been observed was 27·680, and it occurred on the 13th January, 1866; and the lowest 26·914, occurring with a severe thunderstorm and heavy rainfall on the 3rd February, 1865. The difference between these extremes is 0·766. The highest reading during the two hottest months, July and August, was 27·395 in August 1865, and the lowest 27·167 in July 1865, the difference being 0·228.

The greatest monthly range occurs in February, being 0·482; in Scotland the greatest occurs also in February, but it is very much greater, being 1·557. The least monthly range occurs in July, when it is only 0·149; in Scotland in the same month it is 0·897. These figures represent very well the average state of the atmosphere in both countries—the disturbed condition of the atmosphere in the one being the accompaniment of fickle and capricious weather, while in the other the weather is comparatively constant and uniform, and the atmosphere is subject to little variation.

It will be observed that the relations between pressure and tem-

perature are very intimate. The pressure is highest during the coldest months; it thence continues to fall as the temperature rises to the lowest point in the warmest month, and then rises as the temperature falls till it again reaches the maximum in the coldest month. This points out clearly that the atmospheric pressure in Palestine is regulated principally by the annual march of the temperature of the air. The following are the mean pressures for January and July at several places in Asia, reduced only to 32°·0:—Beyrout, 29·897 and 29·535; Astrachan, 30·206 and 29·599; Barnaul, 29·816 and 29·117; Irkutsk, 28·774 and 28·187; Pekin, 30·244 and 29·470; Calcutta, 30·101 and 29·409; and Aden, 29·823 and 27·482. These low summer pressures are caused by the circumstance that the continent of Asia and eastern Europe is at this season heated to a degree much exceeding the temperature of all adjoining regions; consequently from it, as from a furnace, heated air ascends and flows over into neighbouring regions, and thus the pressure over the heated district is diminished. And as in winter the temperature of the same district is very low, the air, being condensed by the cold, settles there, or is stored up during these months, and the pressure is consequently very high. It follows that the nearer we approach the centre of this vast plain, the greater is the difference between the summer and winter pressures. It is the geographical position of Palestine, in reference to this region, with its extremes of temperature and pressure, which furnishes the key to its climate.

In Scotland, on the other hand, the maximum pressure happens in spring, when the polar current is passing over the country on its way to the south; and the pressure is depressed below the average, not during the warm months, but during the *rainy months* of the year. The two causes which bring about a diminution of atmospheric pressure are, 1st, An increase in the temperature of the air over an extensive region, so as to raise it considerably over that of surrounding districts; 2nd, Or an increase in the rainfall over an extensive space of the earth's surface; so that, by the heat disengaged from the vapour when condensed into rain, the temperature of the atmosphere is raised, and the pressure is still further diminished by the quantity of vapour present in the atmosphere. When both causes conspire, that is, when the highest temperature and the greatest rainfall occur in the same months, as in Hindostan and China, the difference between the summer and winter pressure is very great.

On the other hand, the rainfall in Palestine occurs during the winter months, or during the months of greatest pressure. It must not, however, be inferred from this coincidence that the height of the barometer is not influenced by the rainfall, the contrary being the case. I have carefully compared the rainfall during the forty months with the state of the barometer at the time, and find that the barometer fell before or during the rain in every case, except one or two, when the fall of rain happened to be slight. Not only so, but for some time at the com-

mencement and at the end of the dry season, when no rain falls, and the sky is seldom for any length of time perfectly free of clouds, it frequently occurs that the barometer falls more or less, when thundery-looking but rainless clouds appear, when cumulus clouds sail slowly past, and even when the delicate cirrus is pencilled on the deep blue sky. But during the rainless months, when no cloud is seen for many weeks, the variations of the barometer fall to a minimum.

In this country a fall of the barometer to the extent of two or three tenths of an inch below the average, does not necessarily imply any change of weather; but in Palestine a fall of two-tenths of an inch portends a storm of wind and rain, or a thunderstorm of some magnitude.

Temperature.

The mean annual temperature at Jerusalem is 63°·4. Hence, if 1°·0 be allowed for every 300 feet in elevation, the mean temperature near the level of the sea would be about 71°·7, which is about 1°·7 higher than is laid down in Dove's chart of the isothermals of the globe; but since the lines in that part of the earth are laid down from very meagre data, they probably require some slight alteration.

The highest mean monthly temperature is 76°·2 in August, and the lowest 47°·2 in January, which gives a difference of 29°·0 between the hottest month and the coldest month. The temperature of February is nearly as low as that of January; and that of July nearly as high as August. The temperature of March is 58°·4, and April, 59°·8, both months having thus nearly the same temperature; September 72°·2, and October 71°·8, are also nearly alike. Also, the temperature of December, 49°·9, comes near that of January and February, the two coldest months; and the temperature of June, 73°·0, near that of the two warmest months which follow. The great annual increase in the temperature takes place from February to March, 48°·8 to 54°·4; and from April to May, 59°·8 to 67°·8. And the great annual fall of the temperature from October to November, 71°·8 to 61°·0; and November to December, 61°·0 to 49°·9.

This singular distribution of the temperature through the months of the year, so different from what is observed in Great Britain, will no doubt be somewhat modified when the average is made for a greater number of years; but as in each successive year this remarkable partition of the temperature has been pretty constantly maintained, the presumption is, that any such modification will be slight.

The increase from February to March is chiefly brought about by the higher temperature of the day. Thus, while the temperature of the night only increases from 42°·3 to 49°·4, or 7°·2, that of the days increases from 55°·4 to 67°·5, or 12°·1. This increase is therefore caused by the greater strength of the sun's rays, which is still further increased by the gradual cessation of the rainfall, and the consequent clearing of the sky from clouds.

In May, when the sky may be considered as now cleared of clouds altogether, the next great increase of temperature takes place, which, as in the previous case, is mostly caused by the greater heat of the days: for the mean of the nights increases from 50°·0 to 56°·5, or 6°·5, whereas the mean of the days increases from 69°·6 to 79°·2, or 9°·4.

As compared with the three winter months, the wind in March, April, and May blows less frequently from the S.W. and W., and more frequently from N.W., N., N.E., and E. points of the compass, arising from the general flow southwards of the air which accumulates during the winter months in Central Asia and the Arctic regions. Thus, as in Great Britain, the prevalence of the dry polar current clears away the rain and clouds, and ushers in clear weather, strong sun-heat, and a rapidly augmenting temperature.

In the month of August there are three points of interest which are suggested by the figures in Table II.,—viz., the temperature is at the maximum, the atmospheric pressure on the continent of Asia and in eastern Europe is at the minimum, and the winds in Palestine are almost wholly from the N.W. (23 out of 31 days). Suppose a storm, with the usual barometric depression, to overspread Asia, then the wind in Palestine, in reference to this storm, would be N.W., if it corresponded with the direction of the wind in every storm I have hitherto examined. Now, observations prove that at this time atmospheric pressure is low over Asia, and much lower in the interior than in Palestine and Europe. May it not then be inferred that the N.W. wind of Palestine is the result of the low barometer in Asia, as the wind flows round and in upon that region of low pressure in a spirally in-moving course? However this may be, it is certain that the continued predominance of north-westerly and northerly winds in Palestine during the summer months is a principal cause of the rainless character of those months, since they must be well drained of their moisture in passing over the mountains of Asia Minor, and be still further dried in travelling southwards into warmer regions.

The high temperature of October is a marked feature of the climate of Jerusalem. This high temperature appears to be due to the prevailing winds. As already stated, the winds in summer are chiefly N.W. and N.; but in the winter months the S.W. and W. prevail to a very considerable extent. The change (see Table II.) occurs during October and November, and takes place through the E. and S.E. points of the compass. Thus during these months the winds arrive in Palestine from Arabia, and as they bring with them the higher temperature of that region, they may be considered as prolonging the summer of Palestine into October.

Since in winter atmospheric pressure is high in Asia, the winds in Palestine are not affected by it; consequently, the N.W. wind does not preponderate, and the S.W. frequently prevails. In other words, as there is no cause during winter to divert the winds from their normal course, the equatorial current, as well as the polar current, has free scope to run its course over Palestine.

The highest mean temperature of any of the forty months was 77°·0 in July 1866, and the lowest 42°·8 in January 1864, thus giving a difference of 34°·2 between the temperatures of the two extreme months. The mean monthly temperature of 42°·8 was exceptionally low; but the high mean temperature of 77°·0 has been nearly reached repeatedly during the summer months.

Extreme Temperatures.—The highest temperature recorded was 102°·5, on 27th June, 1865, and the lowest 25°·0, on 20th January, 1864, the difference being 77°·5.

High Temperatures.—On the 27th June, when the temperature in shade rose to 102°·5, the lowest during the night only fell to 76°·8, thus giving a mean temperature for the day of 89°·6. On the same day, at 9 a.m., the dry-bulb was 90°·1, and the wet 64°·0; hence, by calculation, the dew-point was 47°·8, and the humidity of the air 22, saturation being 100. This high temperature, therefore, occurred along with an excessive dryness of the atmosphere, when the amount of vapour being small, the sun's rays were little obstructed in their course. The wind was N.W., and a haze was spread round the horizon. On the 19th of the same month, the temperature rose to 101°·0, when the air was nearly as dry, a haze was in the horizon, and the wind N., but so light as to be regarded as a calm. Dr. Chaplin remarks that this great heat began at midnight, and the weather continued intolerably hot and oppressive all day; but a pleasant breeze from the N. sprung up in the afternoon.

A remarkable period of hot weather occurred from the 7th to the 24th October, 1865. What renders this period noteworthy is that, at the same time, *cholera prevailed very badly.* During the whole 18 days, the sky was cloudless, but overspread with thin haze; the wind was from the N.W., N., and E., but so light, except on the 15th and 16th, when it blew a light air from the E., as to be considered a calm. The highest temperature was 94°·0, and on 11 days it rose to at least 90°·0. During the period the mean of the maximum temperatures was 89°·1, and of the minimum temperatures 65°·8, thus giving a mean temperature for the 18 days of 77°·4, or a little higher than the temperature of the warmest month recorded. This high temperature, and calm, close, hazy atmosphere had, no doubt, some influence in promoting the spread of cholera at the time.

Another period of warm weather occurred from the 27th May to the 2nd June, 1866. This period is also remarkable for the plague of locusts which infested the country at the time, and "ate up everything green." During the week it lasted, the temperature rose, on the 29th, to 96°·0; the mean of the highest day temperatures was 90°·2, and of the lowest night temperatures 61°·6, thus giving a mean temperature of 75°·9, and an enormous daily range of 28°·6. The air during the first six days was excessively dry; the mean of the dry-bulb being 84°·3, and of the wet 61°·4, it follows that the mean dew-point was 46°·3, and the mean humidity 26. The wind was N.W. and light. A change took

place on the 1st June, when the wind shifted to S.W., still continuing light; three-fourths of the sky was covered with cirro-stratus clouds, and the air became close and oppressive. On the following morning, the 2nd, the barometer had fallen from 27·305 to 27·148, an unusual fall at this season; and the wind again shifted back to N.W., and blew with the strength of a gale (5 on the scale 0 to 6). At the same time the dew-point rose to 57°·0, and the humidity to 56; and during the day the temperature rose only to 74°·4; on the previous day it had risen to 91°·2.

Low Temperatures.—The coldest period occurred from the 16th January to the 5th February, 1864, and was the only time when the temperature fell so low as to *freeze* the ground, and cover pools of water and ponds with *ice*. On the 17th, ice appeared on the garden path; on the 18th and 19th the water in the cup of the hygrometer was frozen, and ice a quarter-inch thick was formed; on the 20th, the temperature fell to 25°·0, and on the following morning the ice was one inch thick; and on the 22nd, the ice remained all day. Ice was observed again on the 29th and 30th, and on the 3rd, 4th, and 5th February, after which the temperature rose.

On the 20th January, the temperature during the day did not rise above 37°·0, and the mean temperature of the day was only 31°·0. The dry-bulb was 32°·0, the wet 27°·2; and hence the dew-point was only 16°·1, and the humidity 45. During the three cold days of February (the 3rd, 4th, and 5th), the mean of the dry-bulb was 43°·2, of the wet 34°·3; and hence the dew-point was 23°·7, and the humidity 45. The wind was E. and N.E., the air nearly calm, and the sky clear. Thus the periods of greatest cold, as well as the times of greatest heat, were accompanied with a dry, calm atmosphere, which thus allowed free scope to the escape of heat from the earth by terrestrial radiation. During the winter of 1865, the temperature occasionally fell to 38°·0 and 39°·0 from the 13th January to the 3rd March, the lowest during the whole winter being 36°·0 on the 26th February. On that day the dew-point was 32°·6, the lowest for the season, during which no frost or ice appeared. In the winter of 1865-6, ice was found outside the city on the 14th December, 1865, when the temperature fell to 36°·8. From this date to the 2nd February, 1866, the temperature occasionally fell to from 37°·0 to 39°·0, and on New Year's Day to 35°·0, the lowest during the season. On the 20th February it fell to 37°·0; but, except on the 14th December, no frost occurred, and no ice was formed in the city during the winter. In the winter of 1866-7 the temperature fell occasionally from 37°·0 to 39°·0 from the 7th January to 26th February. The lowest temperature during the time was 35°·8 on the 8th January; on the previous morning the temperature was 37°·0; and hail fell during the night, and "perhaps" snow. Neither frost nor ice was observed this winter.

Range of Temperature.—The annual mean daily range of the temperature is 18°·7; the least is about 12°·5, in January and December; and the greatest about 22°·5, from May to October inclusive, that is,

during the dry season. The least in any month was 10°·9, in January 1866, which was also the month when the mean humidity was greatest, being 80. The greatest range was 24°·6, during October 1865. This is the month in which, as already remarked, cholera prevailed, and the meteorological elements were in a very abnormal condition. The nearest approach to this great range was 23°·6 in May 1866, and 23°·5 in August 1864. In these two months the humidity was at the monthly minimum, 39.

The Moisture of the Atmosphere.

To the cases of excessive drought already referred to, may be added other two. On the 2nd of April, 1864, the dry-bulb read 81°·0, the wet 56°·0; hence the dew-point was 39°·0, and the humidity 23. On the 29th May, 1864, at 2 p.m., the dry-bulb was 102°·2, the wet 70°·0; and hence the dew-point was 52°·0, and the humidity about 14. At 9 a.m. on the same day, the temperature of the air was 86°·7, of the dew-point 50°·7, and the humidity 29. Of the drying qualities of this desiccated atmosphere we, in this moist British climate, can form little conception.

On the other hand, during the rainy season, the air is sometimes surcharged with moisture to a degree which is not exceeded even in Ireland, or the west coast of Great Britain. Thus, on the 14th February, 1864, the dry-bulb was 50°·0, the wet 50°·0, and humidity therefore 100. On this occasion Dr. Chaplin remarks that "stones, furniture, and everything were damp." The range of temperature for the day was only 3°·5, and a good deal of rain fell. From the 13th the barometer fell on successive days as follows: 27·522, 27·422, 27·302, and to 27·112 on the 16th.

From the column of the elastic force of vapour, it is seen that there is most vapour dissolved in the atmosphere in July and the other summer months; but, owing to the high temperature as regards the quantity of vapour, it is not available for vegetation, except during night in the form of dew. The column of humidity shows, that during these months the fall of rain is impossible, the point of saturation being so far below that of the temperature; but during winter the humidity rises to an average of 72, and on particular days to 90, or even 100, when rain falls in copious abundance.

The Rainfall.

As regards the rainfall, the climate of Palestine is divided into a wet season and a dry season. The dry season includes the months of May, June, July, August, and September, during which no rain falls; or if any falls in the beginning or end of this period, it is only a few drops that cannot be measured with the gauge. The latter half of April, and the first half of October, may also be included in the dry season.

To the inhabitants of the country, rain is the most important element of the weather, inasmuch as the productiveness of the harvest is altogether dependent on the amount of the rain and the times of the year

when it falls. It accordingly held a prominent place among the promises made to Israel. In Deut. xi. 13, 14, they are promised that if they would love the Lord their God, and serve Him with all their heart and with all their soul, that He would give them the rain of the land in its due season, the first rain and the latter rain, that they might gather in their corn, and their wine, and their oil.

The time of the "first," "former," or "early" rain, so often referred to in Scripture, was usually some time in October, the seed-time of the year in Palestine. Its value, agriculturally, was therefore very great, since, owing to the parched state of the soil on which no rain had fallen for five months, the springing of the seed could not take place till rain fell.

The time of the "latter" rain was the latter half of March and the first half of April, or just before the maturing and ripening of the grain. In November, when all the seed is put into the soil, the mean temperature is still 61°·0; hence, with genial rains and this high temperature, which is higher than we in Scotland enjoy even in the warmest summer months, except on rare occasions, the grain springs luxuriantly. For the next three months the temperature is only as high as it is in this country from the middle of April to the middle of May,—that is, it is only sufficient for the growth of the plants, but quite inadequate for their flowering and ripening; and the same remark is applicable to the low plains of Palestine, except perhaps the plains of Jericho, which are below the level of the sea. Hence, if no rain falls after February, or if the latter rain fails, the crops are scorched up before flowering, and, producing nothing but straw and chaff, famine is the terrible consequence. But if frequent showers accompany the increasing heat in March and April, they attain their full maturity; and as they are gathered in after the dry season has commenced, the grain is stored past in the finest condition possible.

Rainy Season of 1863-4.—As the observations began in November 1863, we cannot go further back than the 1st of the month. In this month rain fell only on two days, 0·3 inch falling on the 10th; the rains began only on the 11th December, slight showers only having fallen previously. Rain fell copiously from the 3rd to the 5th March, and frequent showers, occasionally heavy, from the 13th to the 26th April, after which only a few drops fell. Amount of rain, 8·84 inches.

Rainy Season of 1864-5.—On 8th September 0·08 inch of rain fell; in October only a few drops; and the rainy season began on the 19th November, rain falling in torrents (2·28 inches) on the 25th and 26th. At the end of the first week in March, in the middle of April, and in the first week of May, seasonable showers fell. Amount of rainfall, 14·80. *Rainy Season of* 1865-6.—No rain fell, except a few drops, till 14th November, from which to the 23rd December genial but not heavy rains fell at intervals. From the latter date to the 12th January, 8·65 inches fell. Copious showers fell on the 1st and 2nd, and from the 16th to the 19th March; and refreshing showers on the 3rd and 4th, and 20th and 21st April. After this date the rain ceased. Total amount,

17·87 inches. *Rainy Season of* 1866-7 *to end of February.*—After a slight shower on the 4th October, the rainy season began on the 20th of that month, on which, and four following days, 1·51 inch fell. For the next eleven weeks moderate showers fell frequently; but from the 6th January to the end of February the fall of rain was excessive. Amount of rain 20·62 inches, of which $14\frac{3}{4}$ inches fell in the last seven weeks.

During the rainy season, from 1 to $1\frac{1}{2}$ inches of rain not unfrequently fall in a day; but sometimes these large amounts are greatly exceeded. The largest fall on any day during the period over which the observations extend was 3·175 inches, on the 26th January, 1867. Also on the four days from the 7th to the 10th of the same month, 5·25 inches fell. It was probably in such great rains as these that the people of Israel sat trembling in the street of the house of God when Ezra stood up and rebuked them for their trespasses (Ezra x. 9). If it be remembered that this took place about the beginning of December, when the weather often resembles a cold blustering day of March, the scene, with the pathetic appeal of the people to be allowed to return to their houses, will be better appreciated.

After heavy rains, Bier Eyub, the well of En Rogel of Scripture, flows over in a copious stream to the Kedron. This happened on the following occasions: 9th January, 1864; 8th January, 1866; 9th and 26th January and 26th February, 1867,—five times in all.

All the instances of the rainfall have been carefully compared with the direction of the wind at the time. The result shows, with scarcely an exception, that rain falls uniformly with W. and S.W. winds. When the rain has cleared away, the wind has at the same time shifted to the N.W., N., or N.E., and the air becomes drier, which, by increasing evaporation, chills still further these chilling winds of the winter months; and hence the appropriateness of the proverb: "The north wind driveth away rain; so doth an angry countenance a backbiting tongue" (Prov. xxv. 23).

Hail fell on four occasions, viz.—15th April and 16th December, 1865, and 7th January and 9th February, 1867.

Thunderstorms occurred on 3rd February, 14th and 15th April, 3rd and 8th May, 1st and 3rd November, and 24th December, 1865; 11th April and 10th November, 1866; and 9th February, 1867,—in all eleven thunderstorms. On the last occasion 1·30 inch of rain (and melted hail) fell, the wind blew with the violence of a hurricane, and the barometer fell from 27·564 to 27·327, about the largest fall in twenty-four hours that occurred during the period of observation.

The *Sirocco* occurred twice. On the 20th March, 1864, it advanced from the south, and prevailed all night till the morning of the 21st; maximum temperature, 78°·2; minimum, 58°·6; mean, 68°·4; dew-point, 40°·6; and humidity, 32. A sirocco from the south-east, characterised by Dr. Chaplin as very bad, occurred on the 1st October, 1864, when the temperature rose to 94°·1; the dew-point at 9 a.m. being 49°·8, and the humidity 27. It was succeeded by a slight shower.

ABSTRACT OF METEOROLOGICAL OBSERVATIONS made at JERUSALEM, in Syria, from 1st March, 1865, to 28th February, 1867; and MONTHLY AVERAGES and EXTREMES on a Mean of three years and four months, ending 28th February, 1867. Observations made by Dr. THOMAS CHAPLIN. Lat. 31° 46′ 45″ N.; long. 35° 13′ 0″ E. Height above the sea, 2,500 feet.

TABLE I.—Monthly MEANS and EXTREMES from March 1865, to February 1867.

Months.	BAROMETER.			SELF-REGISTERING THERMOMETERS. IN AIR, AND PROTECTED.							HYGROMETER.		DEDUCTIONS. Glaisher's Tables, 2nd Edition.			WINDS. Number of Days it blew in certain Directions.									RAIN.	
	Mean at Station corrected, and at 32°.	Mean reduced to 32°, and Sea level.	Monthly Range.	Highest in Month.	Lowest in Month.	Monthly Range.	Mean of all the Highest.	Mean of all the Lowest.	Mean Daily Range.	Mean Temperature.	Dry Bulb.	Wet Bulb.	Dew-point.	Elastic Force of Vapour.	Humidity, Sat.=100.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm or Variable.	Mean Pressure on square foot.	Number of Days it fell.	Amount.
1865	In.	In.	In.	Deg.	Deg.	Deg	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	In.											lbs.	Days	In.
March	27·393	30·101	0·228	88·0	39·0	49·0	68·9	50·1	18·8	59·5	61·6	52·6	45·1	·297	55	1	3	6	3	4	3	3	8	0	0·55	5	0·40
April	27·412	30·121	0·262	83·0	42·0	41·0	69·1	48·7	20·4	58·9	62·3	52·3	43·8	·284	50	1	2	4	4	1	3	1	13	0	0·64	2	0·72
May	27·353	30·041	0·344	89·8	43·5	46·3	76·3	55·0	21·3	65·6	69·4	56·0	45·7	·306	43	3	4	2	0	1	7	6	8	0	0·45	3	0·35
June	27·466	30·075	0·261	102·5	56·5	46·0	86·3	63·7	22·6	75·0	79·3	63·1	52·0	·388	39	3	2	2	3	1	3	6	10	0	0·72	0	0·00
July	27·289	29·914	0·150	92·0	57·5	34·5	85·2	63·6	21·6	74·4	79·0	70·0	63·8	·592	59	1	2	0	1	1	4	7	15	0	0·37	0	0·00
August	27·277	29·900	0·187	92·4	61·0	31·4	87·6	65·7	21·9	76·6	79·4	64·8	54·8	·430	42	1	1	0	0	1	2	8	18	0	0·40	0	0·00
Sept.	27·388	30·049	0·227	91·0	54·0	37·0	80·4	59·3	21·1	69·8	70·8	62·4	56·4	·449	59	8	0	0	1	0	0	8	12	0	0·25	0	0·00
October	27·486	30·126	0·248	94·0	54·9	39·1	84·6	60·0	24·6	72·3	75·6	62·6	53·7	·408	46	10	2	3	0	0	0	2	14	0	0·02	0	0·00
Nov.	27·435	30·138	0·208	89·0	46·2	42·8	68·0	52·7	15·3	60·4	60·8	54·9	49·8	·357	67	1	7	6	1	0	0	2	4	9	0	0·34	11	1·48
Dec.	27·444	30·217	0·306	66·1	36·8	29·3	56·0	42·2	13·8	49·1	49·1	44·1	38·7	·236	67	3	10	3	0	0	5	3	7	0	0·14	11	5·15
1866																											
Jan.	27·435	30·234	0·548	58·2	35·0	23·2	51·2	40·3	10·9	45·8	45·8	43·0	39·8	·246	80	2	6	3	1	4	9	2	4	0	0·49	14	4·78
Feb.	27·437	30·212	0·454	65·0	37·0	28·0	56·2	43·1	13·1	49·6	51·1	47·0	42·7	·276	74	0	5	4	2	2	2	6	7	0	0·81	9	3·02
March	27·400	30·126	0·344	78·6	36·0	42·6	64·4	48·1	16·3	56·2	58·2	51·1	44·7	·296	61	2	5	3	0	0	3	4	14	0	1·49	9	3·17
April	27·357	30·060	0·288	81·9	43·0	38·9	70·2	51·0	19·2	60·6	64·2	54·0	45·6	·305	50	5	2	3	3	2	8	3	4	0	0·59	4	0·27
May	27·374	30·026	0·160	96·0	49·0	47·0	81·5	57·9	23·6	69·7	75·2	59·4	48·2	·332	39	3	5	1	4	1	1	3	13	0	0·61	0	0·00
June	27·317	29·969	0·275	91·2	54·2	37·0	80·4	59·6	20·8	70·0	73·8	62·0	53·4	·410	49	2	0	0	2	0	8	3	15	0	1·32	3	0·00
July	27·267	29·860	0·176	95·3	59·8	35·5	88·4	65·6	22·8	77·0	81·3	65·9	55·3	·440	40	1	0	0	1	0	1	5	23	0	0·66	0	0·00
August	27·281	29·899	0·192	95·2	61·3	33·9	87·2	64·9	22·3	76·0	79·4	65·5	56·0	·449	44	1	0	0	0	1	2	2	25	0	0·53	0	0·00
Sept.	27·351	29·982	0·176	100·0	59·8	40·2	85·8	62·7	23·1	74·2	76·7	65·0	56·8	·462	50	7	0	0	1	0	1	1	20	0	0·14	0	0·00
October	27·437	30·100	0·190	92·8	46·8	46·0	77·4	58·7	18·7	68·0	70·5	59·1	50·3	·366	49	1	3	10	2	1	8	1	5	0	0·34	5	1·57
Nov.	27·427	30·158	0·326	84·0	39·0	45·0	64·2	49·1	15·1	56·6	57·4	50·5	44·2	·290	61	0	5	10	1	0	6	2	6	0	0·61	8	1·66
Dec.	27·468	30·230	0·285	71·2	40·5	30·7	57·5	44·9	12·6	51·2	51·4	44·5	37·4	·224	59	0	4	4	3	1	11	2	6	0	0·37	13	2·51
1867																											
Jan.	27·466	30·244	0·420	65·1	35·8	29·3	55·5	41·8	13·7	48·6	50·1	45·3	40·2	·253	69	1	9	6	1	1	9	1	3	0	0·53	11	9·02
Feb.	27·507	30·296	0·330	60·5	36·5	24·0	52·7	40·7	12·0	46·7	47·9	44·0	39·7	·244	74	1	4	0	1	2	2	8	4	0	1·56	12	5·86

TABLE II.—Monthly MEANS and EXTREMES on a mean of Three Years and Four Months, ending February 1867.

Months.	BAROMETER.			SELF-REGISTERING THERMOMETERS. IN AIR, AND PROTECTED.							HYGROMETER.		DEDUCTIONS, Glaisher's Tables, 2nd Edition.			WINDS.										RAIN.	
																Number of Days it blew in certain Directions									Mean Pressure on square foot.	Number of Days it fell.	Amount.
	Mean at Station corrected, and at 32°.	Mean reduced, to 32°, and Sea level.	Monthly Range.	Highest in Month.	Lowest in Month.	Monthly Range.	Mean of all the Highest.	Mean of all the Lowest.	Mean Daily Range.	Mean Temperature.	Dry Bulb.	Wet Bulb.	Dew-point.	Elastic Force of Vapour.	Humidity, Sat.=100.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm or Variable.			
	In.	In.	In.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	In.											lbs.	Days	In.
Jan.	27·451	30·211	0·420	71·1	25·0	46·1	53·4	40·9	12·5	47·2	47·2	43·2	38·7	·235	73	1	6	6	1	2	8	4	3	0	0·59	10	5·18
Feb.	27·426	30·177	0·482	69·5	30·9	38·6	55·4	42·3	13·1	48·8	49·6	45·3	40·7	·255	72	1	3	5	1	2	4	6	6	0	0·89	8	3·57
March	27·401	30·095	0·289	88·0	36·0	52·0	67·5	49·4	18·1	58·4	60·5	52·1	44·8	·298	56	2	4	7	2	2	3	4	7	0	0·88	6	1·53
April	27·359	30·045	0·321	85·6	42·0	43·6	69·6	50·0	19·6	59·8	62·6	52·8	44·5	·292	51	2	1	3	4	2	6	4	7	0	0·67	4	0·86
May	27·398	30·036	0·258	100·0	43·5	56·5	79·2	56·5	22·7	67·8	70·7	57·7	47·8	·333	45	3	3	3	4	1	3	6	8	0	0·76	1	0·12
June	27·370	29·970	0·257	102·5	54·2	48·3	83·0	63·0	20·0	73·0	75·9	62·8	53·5	·411	47	3	1	2	2	0	4	8	10	0	1·40	1	0·00
July	27·278	29·870	0·149	95·3	57·1	38·2	86·0	63·6	22·4	74·8	78·9	67·5	59·7	·512	52	2	1	0	1	0	2	8	18	0	0·70	0	0·00
August	27·286	29·874	0·184	101·0	56·8	44·2	87·5	65·0	22·5	76·2	79·4	64·6	54·5	·425	42	1	0	1	0	1	1	4	23	0	0·59	0	0·00
Sept.	27·374	29·987	0·210	100·0	54·0	46·0	83·6	60·9	22·7	72·2	73·9	63·7	56·2	·456	54	8	1	0	1	0	1	6	13	0	0·53	0	0·00
Oct.	27·459	30·065	0·196	94·9	46·8	48·1	83·1	60·6	22·5	71·8	73·8	60·7	51·1	·376	46	5	3	7	3	0	3	1	9	0	0·35	3	0·52
Nov.	27·448	30·126	0·276	89·0	39·0	50·0	63·9	53·1	15·8	61·0	61·1	53·6	47·1	·324	60	1	6	10	2	0	3	4	4	0	0·52	6	1·50
Dec.	27·443	30·176	0·351	71·2	35·1	36·1	56·2	43·5	12·7	49·9	50·9	46·4	41·7	·265	72	1	4	5	2	1	8	4	6	0	0·58	11	3·00
	27·391	30·052	0·233	102·5	25·0	77·5	72·8	54·1	18·7	63·4	65·4	55·9	48·1	·336	53	30	33	49	23	11	46	59	114	0	0·70	50	16·28

ANALYSIS OF GLASS FOUND IN CAPTAIN WARREN'S SHAFTS AT JERUSALEM.

THE LABORATORY, 7, Quality Court, Chancery Lane.

London, October 28th, 1871.

SIR,—I beg leave to report to you the results of my analysis of the portion of Jewish glass you furnished me with on the 7th of October instant.

The portion furnished consisted of a large number of small pieces, many of which had undergone a change both in structure and colour by time and exposure.

The portion analysed consisted of those pieces which appeared to me to have undergone the least, if any, change.

In 100 parts.

Silica	69.30
Alumina	3.20
Oxide of Iron (Fe_2O_3)	2.00
Oxide of Antimony	0.29
Oxide of Lead	a trace
Lime	8.50
Magnesia	0.55
Potash	1.49
Soda	13.79
Phosphoric Acid	0.80
Loss in analysis	0.08
	100.00

And, specific gravity 2·430

I am, Sir, your obedient servant,

DUGALD CAMPBELL.

LETTER FROM THE SECRETARY OF THE AMERICAN ASSOCIATION.

UNIVERSITY, NEW YORK, *Nov.* 15, 1871.

DEAR SIR,—I have the honour to inform you that the Rev. Dr. J. P. Thompson having, by reason of ill-health, resigned the chairmanship of the American Palestine Exploration Committee, the Rev. R. D. Hitchcock, D.D., has been elected to fill his place. The fearful devastation of the fire at Chicago has so drawn upon the sympathy and benevolence of all, that our special work is retarded. We shall, however, make the effort to start our expedition this coming winter. I have the honour to remain,

Yours with respect,

HOWARD CROSBY, *Secretary.*

LETTER FROM MR. SAMUEL SHARPE.

SIR,—I beg to call your attention to an error in page 148 "Warren's Letters," *Quarterly Statement* No. V., which arises from relying on the authorised version of the Bible.

Jeremiah xix. 2 should be translated, "The valley of the son of Hinnom, which is by the entrance of the *Pottery* Gate."

This gate, where the potsherds were thrown, has been thought to be the same as the Dung gate of Nehemiah iii. 14. That is doubtful, but at any rate Jeremiah does not place it in the east near the Kedron.

Yours obediently,

32, *Highbury Place, July* 31, 1871. SAMUEL SHARPE.

CAPTAIN STEWART'S LETTERS.

I.

HOTEL JERUSALEM, JAFFA, 11*th Nov.*, 1871.

I suppose you will wish to hear of our safety so far as we have got on our journey. We reached Alexandria on Friday the 3rd, just in time to be too late for the Austrian Lloyd steamer to Jaffa, so had to rest in Alexandria till the following Monday. The captain of the P. and O. steamer *Ceylon* was good enough to allow all the baggage to remain on board his ship, and the N.C. officers stayed there also. Monday we shifted baggage to the Messageries boat *Nile*, and started same afternoon. The following day touched at Port Said, and remained some hours, leaving again in the afternoon of Tuesday, and sighted Jaffa early next morning, when I at once landed and paid a visit to M. Kayat, brother to the consul, the latter being in England. He kindly gave a permit to land baggage free of customs duty, and together we looked for storage room; the "strus," as the natives call them in the bazaars, turned out such miserable hovels that I declined to have anything to say to them, and proceeded to the German colony which has sprung up here in the outskirts of the town. The landlord and owner of this hotel most kindly offered all assistance, and undertook to store our baggage at a very moderate rate, not one-fourth of what the enterprising Arabs demanded, so I at once closed with him, and had all our baggage conveyed hither, my reasons for selecting Jaffa for storage-place at present, being that it is much nearer Ramleh, where we break ground, and clearly we must be near our base of operations till we are more conversant with the resources of the country, and have ascertained what requisites we should have with us. Besides, it saves the cost of transport to Jerusalem, a considerable item, as we have with us some thirty cases.

Since our arrival we have all been at work from sun-rise to sun-down unpacking cases and repacking for the field, examining instruments, &c., &c. Some of the instruments, I am sorry to say, have been shaken, but I think none beyond our powers to put right. I had intended going to Jerusalem at once to see our consul, but found the men could do nothing without me at first, being quite unaccustomed to such work as is before us; indeed, to all of us it has a novel character. We have, I think, broken the neck of the work, and I hope to start for Jerusalem on Monday.

R. W. STEWART.